

REMARKS

This Amendment is in response to the Final Office Action dated October 13, 2010. Applicant respectfully requests reconsideration and allowance of all pending claims in view of the above-amendments and the following remarks.

I. CLAIM OBJECTIONS

Claim 19 was objected to based on a typographical error. With this amendment, claim 19 is amended to replace “ supplementary” with “supplementary”.

II. CLAIM REJECTION – 35 USC § 103

Claims 2-11 and 14-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri et al., U.S. 2004/0017777 in view of Li et al., U.S. Patent No. 6,940,827.

Claim 12 was rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri, in view of Li, and further in view of Beasley et al., U.S. Publication No. 2002/0187749 A1.

Claim 13 was rejected under 35 U.S.C. 103(a) as being unpatentable over Chaudhuri, in view of Li, and further in view of Attar et al., U.S. Publication No. 2004/0181569 A1.

A. **Present Application**

1. Technical Problem

In an example described in the present application, an UMTS HS-DPA supplementary link can be synchronised at sub-frame level by making a search for the beginning of the UMTS slots (knowing that each sub-frame contains a predetermined number of UMTS slots, for example 3). This search is done using the PSCH signal. This signal is in the form of a packet of 256 identical chips sent at the beginning of each slot. Finally, the frame of the UMTS HS-DPA supplementary link is synchronised using the SSCH (Secondary Synchronisation Channel) signal that has the same shape as the PSCH signal except that packets of 256 chips transmitted are modulated by known information.

On the other hand, synchronisation of the OFDM HS-DPA supplementary link is now

more difficult because, unlike the UMTS HS-DPA supplementary link, the OFDM HS-DPA supplementary link is not intimately linked to the UMTS system. According to the current technique, the OFDM HS-DPA supplementary link can be synchronised at chip level using the delay interval that represents a part of the OFDM symbol (the last part). This synchronisation at chip level is obtained by a simple conventional self-correlation on the received OFDM HS-DPA signal. But, once this synchronisation has been done at chip level, it is impossible to know the beginning of the sub-frames and frames because the OFDM signal specified in the HS-DPA frame does not contain the PSCH and SSCH signals necessary for synchronisations at sub-frame and frame levels. According to the existing technique, synchronisation of the OFDM HS-DPA supplementary link at sub-frame level is specific to the OFDM system and is based on insertion of signals specific to synchronisation at sub-frame level. But these specific signals increase the load of the OFDM HS-DPA supplementary link.

2. Exemplary Embodiment of the Present Disclosure

In an example of the present claims, the beginning of at least one sub-frame of the supplementary channel is offset by a time interval with a determined duration not equal to zero (Δt) with respect to a determined time (t_0) on the principal channel, so as to enable synchronisation of the supplementary channel at sub-frame level in a terminal, by detection of the determined time (t_0) and by adding said time interval (Δt).

Therefore, the general principal is to align sub-frames of the supplementary channel in time with a known reference time (t_0) identified on the principal channel and that can therefore be determined on a terminal (receiver), for example.

The time interval (Δt) and the time (t_0) determined on the principal channel are either known in advance by the terminal (receiver), or are sent to the receiver dynamically through the principal channel (see the different embodiments of the invention discussed in detail below).

Thus, in this example, the modulation types of the principal channel and the supplementary channel are different in nature, and the supplementary channel is synchronized at the sub-frame level based on a known reference time (t_0) identified on the principal channel.

Synchronization of the supplementary channel is thus linked to a known reference time

on the principal channel. And this synchronization is performed in the same terminal and/or base station.

B. Chaudhuri

Chaudhuri describes a technique for synchronizing signals transmitted to a mobile terminal by two distinct base stations. In Chaudhuri, such synchronization is based on determining and using “OFF” and “Tm” parameters. The mobile terminal determines the “OFF” and “Tm” parameters. For example, the mobile terminal performs the following steps for determining the “OFF” parameter ([0040]):

- receiving frames transmitted by a current base station through a DPCH channel and frames transmitted by a neighboring base station through a CCPCH channel;
- selecting an instant associated to one of the frames transmitted through the CCPCH channel of the neighboring base station and an instant associated to one of the frames transmitted through the DPCH channel of the current base station;
- determining the “OFF” parameter by doing the difference between the two selected instants.

Then, the mobile terminal transmits to the UTRAN network the “OFF” and “Tm” parameters ([00442]).

The UTRAN network uses the “OFF” and “Tm” parameters for synchronizing the frames transmitted through the DPCH channel of the neighboring base station with the frames transmitted through the DPCH channel of the current base station ([0043]).

1. Examiner’s “Series of Channels” in Chaudhuri

The Examiner suggests,

Chaudhuri discloses a synchronization process for a supplementary channel associated with a symmetric two-directional principal channel, said supplementary channel and said symmetric two-directional principal channel being implemented by a same base station.

The Examiner also suggests,

said symmetric two-directional principal channel comprising a principal uplink channel and a principal downlink channel, particularly for low or medium speed transmission of signalling and control data and information (Chaudhuri: pars 0003-0005, CDMA, OFDM systems, par 0026, UMT8 wireless phone system. It is well known in the art that in CDMA systems, such as 18-95 or cdma 2000 technology, a series of channels, either downlink or uplink have been specified, such as pilot, sync, paging, access, forward and reverse (fundamental and supplemental) traffic channels, in which the control channels are often for low or medium speed transmission of signaling and control information),

But Chaudhuri does not disclose that these “series of channels” have the claimed synchronization link between a sub-frame of a supplementary channel and a determined time on the principal downlink channel within the same base station or terminal, as defined in Applicant’s claim 19.

2. Different Base Stations - Not Same

The Examiner further states,

Chaudhuri further discloses the frame offset between downlink channels (could be between principal and supplementary) and detects the time offset at the mobile station for channel synchronization (Chaudhuri: Fig 5, pars 0038, 0041). Including detecting a determined time (to) on the principal downlink channel (Figs 2-3); obtaining the beginning of a sub-frame of the supplementary channel, by offsetting the determined time (to) detected in a) by a time interval with a determined duration not equal to zero (delta t) (Figs 2-3, 5-8).

Firstly, “could be” is not a sufficient criteria for determining an anticipation under 35 U.S.C. §102 or a teaching, suggestion or motivation under 35 U.S.C. §103.

Secondly, these sections of Chaudhuri relate to synchronization of signals from different base stations. (“Thus, even when two basestations align their transmissions during a soft hand over, there may still be a time offset between the frames transmitted by the two base stations.”)(Para. [0038], last sentence) (Emphasis added). These sections do not at all relate to principal and supplementary channels on a same base station and/or terminal.

So the Examiner's analysis of Chaudhuri's synchronization between two different base stations does not relate to the Examiner comments regarding "series of channels" in a particular terminal or base station, and also does not relate to the invention recited in Applicant claims.

3. Channels that are Different in Nature

Chaudhuri also **fails to disclose** the following feature:

"said supplementary channel and said symmetric two-directional principal channel being different in nature".

An example of the present patent application relates to a technique for synchronizing an OFDM HS-DPA supplementary link (supplementary channel) with a UMTS principal link (symmetric two-directional principal channel). As discussed in the Application, an OFDM HS-DPA supplementary link uses a modulation different from that used in the UMTS system (spectrum spreading, CDMA).

On the contrary, Chaudhuri relates to a technique for synchronizing a DPCH channel of a current base station with a DPCH channel of a neighboring base station.

4. Chaudhuri's Synchronization Not Performed by Terminal

Furthermore, Chaudhuri **fails to disclose** the following feature:

"the terminal performs the synchronizing of the supplementary channel with respect to the principal channel".

Chaudhuri teaches to use a UTRAN network for synchronizing a DPCH channel of a current base station with respect to a DPCH channel of a neighboring base station.

In addition, Chaudhuri **is silent about** the following feature:

"Obtaining, by the terminal, the beginning of a sub-frame of the supplementary channel, by offsetting the determined time detected in 1) by a time interval with a determined duration not equal to zero".

C. **Li**

LI describes (see figure 11) a wireless communication device comprising a CDMA transmitter (1101), a CDMA receiver (1102) and an OFDM transmitter (1103).

Li's technique is not aiming to solve the technical problem of synchronizing a

supplementary channel associated to a principal channel.

Li **fails to disclose** the following features:

- “said *supplementary channel* and said *symmetric two-directional principal channel* being *different in nature*”;
- “wherein synchronizing is performed by the terminal”;
- the *terminal performs* steps 1) and 2b) of the synchronization process.

D. Combination of Chaudhuri and Li

Even if these two references were combined as suggested by the Examiner, the combination of Chaudhuri and Li is not relevant to Applicant’s claims since the proposed combination clearly does not suggest the following features:

- “said *supplementary channel* and said *symmetric two-directional principal channel* being *different in nature*”;
- “wherein synchronizing is performed by the terminal”;
- the *terminal performs* steps 1) and 2b) of the synchronization process.

Regarding all the aforementioned arguments, it appears that the claims are new and non-obvious.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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